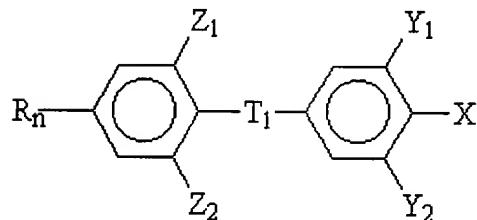
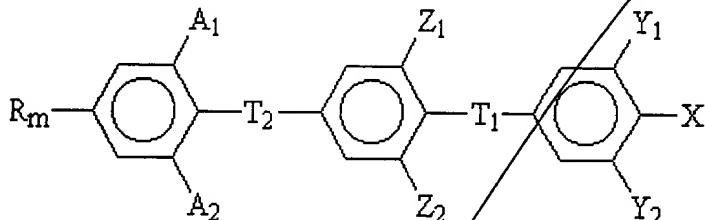


ABSTRACT

A new class of liquid crystal compounds is based on tolane and bis-tolane structures:



(Structure IV)

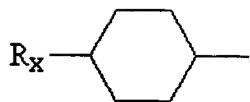


(Structure V)

in which X is a polar group such as F (fluoro), CN (cyano), OCF₃ (trifluoromethoxy), or NCS (isothiocyanate) at least one of the pairs of sites Y₁ and Y₂, Z₁ and Z₂, and for the bis-tolane derivatives, A₁ and A₂ are fluoro groups.

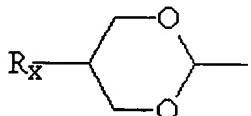
- 10 T₁ for the tolane derivatives is always a triple bond. For the bis-tolane derivatives, T₁ and T₂ are either both triple bonds or one of the two groups is a double bond with the other remains a triple bond.

- R_n or R_m may be an alkyl group having the general formula C_nH_{2n+1}, an alkenyl group having the general formula C_nH_{2n-1}, an alkoxy group having the general formula OC_nH_{2n+1}, or an alkenoxy group having the general formula -OC_nH_{2n-1}. Additionally, for the tolane compounds, R_n may be a cyclohexyl substituent:



(Structure VI)

or a dioxane substituent:



5 (Structure VII)

in which R_x is an alkyl group having the general formula C_xH_{2x+1} , an alkenyl group having the general formula C_xH_{2x-1} , an alkoxy group having the general formula OC_xH_{2x+1} , or an alkenoxy group having the general formula OC_xH_{2x-1} .

These compounds exhibit useful nematic ranges and melting points. Also disclosed are

10 eutectic mixtures including these compounds.